

## Claims

[c1] 1. A method of selecting a physiological data manipulation process, the method comprising the acts of:  
receiving raw data including an asynchronous component having diagnostic information and including a synchronous component;  
separating the asynchronous component from the synchronous component; and  
selecting a data manipulation process based on the diagnostic information.

[c2] 2. A method as set forth in claim 1, wherein the act of selecting of a data manipulation process includes classifying an abnormality condition of the diagnostic information.

[c3] 3. A method as set forth in claim 2, wherein the act of classifying the abnormality condition includes the act of analyzing at least one of a rhythm, an atrio-ventricular conduction, a ventricular rate, a P wave amplitude, a QT interval and an age qualifier from the diagnostic information.

[c4] 4. A method as set forth in claim 1, wherein the data manipulation process comprises a lossy process and a lossless process, and wherein the method further comprises the act of processing the raw data using a one of the lossy process and the lossless process.

[c5] 5. A method as set forth in claim 4, wherein the lossy process includes the acts of low-pass filtering of the asynchronous components of the raw data to produce filtered data, down-sampling the filtered data to produce down-sampled data, re-quantization of the down-sampled data, comparing the down-sampled data to produce compared data, polarity reversal encoding of the compared data to produce polarity reverse encoded data, and Huffman encoding of the polarity reverse encoded data to produce lossily compressed data.

[c6] 6. A method as set forth in claim 4, wherein the lossless process includes the acts of comparing the synchronous component of the raw data to produce compared data and Huffman encoding of the compared data to produce losslessly compressed data.

[c7] 7. A method as set forth in claim 1, wherein the act of separating the asynchronous

component from the synchronous component includes generating a data condition of the diagnostic information.

- [c8] 8. A method of processing physiological data, the method comprising:  
receiving raw data including an asynchronous component having diagnostic information and including a synchronous component;  
separating the asynchronous component from the synchronous component;  
selecting a data manipulation process based on the diagnostic information; and  
processing the asynchronous component and the synchronous component using the data manipulation process selected.
- [c9] 9. A method as set forth in claim 8, wherein the act of selecting of a data manipulation process includes classifying an abnormality condition of the diagnostic information.
- [c10] 10. A method as set forth in claim 9, wherein the act of classifying the abnormality condition includes the act of analyzing at least one of a rhythm, an atrio-ventricular conduction, a ventricular rate, a P wave amplitude, a QT interval and an age qualifier from the diagnostic information.
- [c11] 11. A method as set forth in claim 8, wherein the data manipulation process comprises a lossy process and a lossless process, and wherein the method further comprises the act of processing the raw data using a one of the lossy process and the lossless process.
- [c12] 12. A method as set forth in claim 11, wherein the lossy process includes the acts of low-pass filtering of the asynchronous components of the raw data to produce filtered data, down-sampling the filtered data to produce down-sampled data, re-quantization of the down-sampled data, comparing the down-sampled data to produce compared data, polarity reversal encoding of the compared data to produce polarity reverse encoded data, and Huffman encoding of the polarity reverse encoded data to produce lossily compressed data.
- [c13] 13. A method as set forth in claim 11, wherein the lossless process includes the acts of comparing the synchronous component of the raw data to produce compared data and Huffman encoding of the compared data to produce losslessly

compressed data.

- [c14] 14. A method as set forth in claim 8, wherein the act of separating the asynchronous component from the synchronous component includes generating a data condition of the diagnostic information.
- [c15] 15. A medical device comprising:
  - a patient data acquisition device that collects physiological data including an asynchronous component having diagnostic information and a synchronous component; and
  - a software program for selecting a method of processing the physiological data, the software program including a signal separation module that receives the data from the data collection and separates the asynchronous component from the synchronous component; a selector module that selects a data manipulation process selection based on the diagnostic information.
- [c16] 16. A medical device as set forth in claim 15, wherein the signal separation module further comprises:
  - a classifier module to classify an abnormality condition of the diagnostic information.
- [c17] 17. A medical device as set forth in claim 16, wherein the classifier module further comprises:
  - an analysis module to analyze at least one of a rhythm, an atrio-ventricular conduction, a ventricular rate, a P wave amplitude, a QT interval and an age qualifier from the diagnostic information.
- [c18] 18. A medical device as set forth in claim 15, wherein the data manipulation process is a lossy process that low-pass filters, down-samples, re-quantizes, compares, polarity reversal encodes and Huffman encodes the data.
- [c19] 19. A medical device as set forth in claim 15, wherein the data manipulation process is a lossless process that compares and Huffman encodes the data.
- [c20] 20. A medical device as set forth in claim 15, wherein the selector module further comprises:

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a generator module to generate a data condition of the diagnostic information.

[c21] 21. A software program for selecting a method of processing the physiological data, the software program comprising:  
a data collection module to collect data;  
a signal separation module that receives the data from the data collection module and separates the asynchronous component from the synchronous component; and  
a selector module that selects a data manipulation process based on the diagnostic information.

[c22] 22. A software program as set forth in claim 21, wherein the signal separation module further comprises:  
an analysis module to analyze at least one of a rhythm, an atrio-ventricular conduction, a ventricular rate, a P wave amplitude, a QT interval and an age qualifier from the diagnostic information.

[c23] 23. A software program as set forth in claim 21, wherein the data manipulation process is a lossy process that low-pass filters, down-samples, re-quantizes, compares, polarity reversal encodes and Huffman encodes the data.

[c24] 24. A software program as set forth in claim 21, wherein the data manipulation process is a lossless process that compares and Huffman encodes the data.

[c25] 25. A method of automatically selecting a data compression scheme, the method comprising:  
receiving raw data including an asynchronous component and a synchronous component;  
separating the asynchronous component from the synchronous component;  
classifying a data condition based on the asynchronous component; and  
selecting a data compression scheme based on the data condition.

[c26] 26. A method as set forth in claim 25, wherein the act of selecting of a data manipulation process includes classifying an abnormality condition of the asynchronous component.

[c27] 27. A method as set forth in claim 25, wherein data compression scheme

comprises a lossy process and a lossless process, and wherein the method further comprises the act of processing the asynchronous component and the synchronous component using a one of the lossy process and the lossless process.

- [c28] 28. A method as set forth in claim 27, wherein the data compression scheme is a lossy process.
- [c29] 29. A method as set forth in claim 27, wherein the data compression scheme is a lossless process.
- [c30] 30. A medical device comprising:
  - a patient data acquisition device that collects physiological data including an asynchronous component having diagnostic information and a synchronous component; and
  - a software program for selecting a method of processing the physiological data and manipulating the physiological data based on the method selected, the software program including a signal separation module that receives the data from the data collection and separates the asynchronous component from the synchronous component; a selector module that generates a data manipulation process selection based on the diagnostic information; and a data manipulator module that manipulates the asynchronous component and the synchronous component according to the component type and the data manipulation process selection of the selector module.
- [c31] 31. A medical device as set forth in claim 30, wherein the signal separation module further comprises:
  - a classifier module to classify an abnormality condition of the diagnostic information.
- [c32] 32. A medical device as set forth in claim 31, wherein the classifier module further comprises:
  - an analysis module to analyze at least a one of a rhythm, an atrio-ventricular conduction, a ventricular rate, a P wave amplitude, a QT interval and an age qualifier from the diagnostic information.
- [c33] 33. A medical device as set forth in claim 30, wherein the data manipulation

process is a lossy process that low-pass filters, down-samples, re-quantizes, compares, polarity reversal encodes and Huffman encodes the data.

[c34] 34. A medical device as set forth in claim 30, wherein the data manipulation process is a lossless process that compares and Huffman encodes the data.

[c35] 35. A medical device as set forth in claim 30, wherein the selector module further comprises:  
a generator module to generate a data condition of the diagnostic information.

[c36] 36. A software program for compressing physiological data, the software program comprising:  
a data collection module to collect data;  
a signal separation module that receives the data from the data collection module and separates the asynchronous component from the synchronous component;  
a selector module that selects a data manipulation process based on the diagnostic information; and  
a data manipulator module that manipulates the asynchronous component and the synchronous component based on the data manipulation process selected.

[c37] 37. A software program as set forth in claim 36, wherein the signal separation module further comprises:  
an analysis module to analyze at least one of a rhythm, an atrio-ventricular conduction, a ventricular rate, a P wave amplitude, a QT interval and an age qualifier from the diagnostic information.

[c38] 38. A software program as set forth in claim 36, wherein the data manipulation process is a lossy process that low-pass filters, down-samples, re-quantizes, compares, polarity reversal encodes and Huffman encodes the data.

[c39] 39. A software program as set forth in claim 36, wherein the data manipulation process is a lossless process that compares and Huffman encodes the data.

[c40] 40. A method of automatically selecting and applying data compression scheme, the method comprising:  
receiving raw data including an asynchronous component and a synchronous

component;  
separating the asynchronous component from the synchronous component;  
classifying a data condition based on the asynchronous component;  
selecting a data compression scheme based on the data condition; and  
compressing the asynchronous component and the synchronous component based  
on the data compression scheme selected.

[c41] 41. A method as set forth in claim 40, wherein data compression scheme comprises a lossy process and a lossless process, and wherein the method further comprises the act of processing the asynchronous component and the synchronous component using a one of the lossy process and the lossless process.

[c42] 42. A method as set forth in claim 41, wherein the act of selecting of a data manipulation process includes classifying an abnormality condition of the asynchronous component.

[c43] 43. A method as set forth in claim 41, wherein the data compression scheme is a lossy process.

[c44] 44. A method as set forth in claim 40, wherein the data compression scheme is a lossless process.